WHAT IS CLAIMED:

1. An isolated DNA molecule from a thermophilic bacterium, the isolated DNA molecule encoding a DNA polymerase III-type enzyme subunit.

2. The isolated DNA molecule according to claim 1, wherein the enzyme subunit is selected from the group consisting of alpha, beta, tau, gamma, epsilon, delta, delta prime, and SSB subunits.

3. The isolated DNA molecule according to claim 2, wherein the enzyme subunit is a delta subunit.

4. The isolated DNA molecule according to claim 3, wherein the thermophilic bacterium is *Aquifex aeolicus*.

5. The isolated DNA molecule according to claim 4, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 124.

6. The isolated DNA molecule according to claim 4, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 123 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 123 under stringent conditions.

7. The isolated DNA molecule according to claim 3, wherein the thermophilic bacterium is *Thermus thermophilus*.

8. The isolated DNA molecule according to claim 7, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 158.

9. The isolated DNA molecule according to claim 7, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 157 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 157 under stringent conditions.

10. The isolated DNA molecule according to claim 3, wherein the thermophilic bacterium is *Thermatoga maritima*.

11. The isolated DNA molecule according to claim 10, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 146.

12. The isolated DNA molecule according to claim 10, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 145 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 145 under stringent conditions.

13. The isolated Dna molecule according to claim 3, wherein the thermophilic bacterium is *Bacillus stearothermophilus*.

14. The isolated DNA molecule according to claim 13, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 178.

15. The isolated DNA molecule according to claim 13, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 177 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 177 under stringent conditions.

16. The isolated DNA molecule according to claim 2, wherein the replication enzyme subunit is a delta prime subunit.

17. The isolated DNA molecule according to claim 16, wherein the thermophilic bacterium is *Aquifex aeolicus*.

18. The isolated DNA molecule according to claim 17, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 126.

19. The isolated DNA molecule according to claim 17, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 125 or hybridizes to

a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 125 under stringent conditions.

20. The isolated DNA molecule according to claim 16, wherein the thermophilic bacterium is *Thermus thermophilus*.

21. The isolated DNA molecule according to claim 20, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 156.

22. The isolated DNA molecule according to claim 20, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 155 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 155 under stringent conditions.

23. The isolated DNA molecule according to claim 16, wherein the thermophilic bacterium is *Thermatoga maritima*.

24. The isolated DNA molecule according to claim 23, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 146.

25. The isolated DNA molecule according to claim 23, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 147 or hybridizes to a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 147 under stringent conditions.

26. The isolated DNA molecule according to claim 16, wherein the thermophilic bacterium is *Bacillus stearothermophilus*.

27. The isolated DNA molecule according to claim 26, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 180.

28. The isolated DNA molecule according to claim 26, wherein the DNA molecule comprises a nucleotide sequence of SEQ. ID. No. 179 or hybridizes to

a DNA molecule comprising the nucleotide sequence of SEQ. ID. No. 179 under stringent conditions.

29. An isolated replication enzyme subunit of a thermophilic bacterium which is encoded by the isolated DNA molecule of claim 1.

30. The isolated replication enzyme subunit according to claim 29, wherein the replication enzyme subunit is selected from the group of consisting alpha, beta, tau, gamma, epsilon, delta, delta prime, and SSB subunits.

31. The isolated replication enzyme subunit according to claim 30, wherein the replication enzyme subunit is a delta subunit.

32. The isolated replication enzyme subunit according to claim 31, wherein the thermophilic bacterium is *Aquifex aeolicus.*

33. The isolated replication enzyme subunit according to claim 32, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 124.

34. The isolated replication enzyme subunit according to claim 31, wherein the thermophilic bacterium is *Thermus thermophilus*.

35. The isolated replication enzyme subunit according to claim 34, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 158.

36. The isolated replication enzyme subunit according to claim 31, wherein the thermophilic bacterium is *Thermotoga maritima*.

37. The isolated replication enzyme subunit according to claim 36, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 146.

38. The isolated replication enzyme subunit according to claim 31, wherein the thermophilic bacterium is *Bacillus stearothermophilus*.

39. The isolated replication enzyme subunits according to claim 38, wherein the delta subunit comprises an amino acide sequence of SEQ. ID. No. 178.

40. The isolated replication enzyme subunit according to claim 30, wherein the replication enzyme subunit is a delta prime subunit.

41. The isolated replication enzyme subunit according to claim 40, wherein the thermophilic bacterium is *Aquifex aeolicus*.

42. The isolated replication enzyme subunit according to claim 41, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 126.

43. The isolated replication enzyme subunit according to claim 40, wherein the thermophilic bacterium is *Thermus thermophilus*.

44. The isolated replication enzyme subunit according to claim 43, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 156.

45. The isolated replication enzyme subunit according to claim 40, wherein the thermophilic bacterium is *Thermotoga maritima*.

46. The isolated replication enzyme subunit according to claim 45, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 148.

47. The isolated replication enzyme subunit according to claim 40, wherein the thermophilic bacterium is *Bacillus stoarothermophilus*.

48. The isolated replication enzyme subunit according to claim 47, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 180.

49. An expression system comprising an expression vector into which is inserted a heterologous DNA molecule according to claim 1.

50. The expression system according to claim 40, wherein the heterologous DNA molecule is in sense orientation and correct reading frame.

51. A host cell comprising a heterologous DNA molecule according to claim 1.

52. A method of producing a recombinant thermostable DNA polymerase III-type enzyme, or subunit thereof, from a thermophilic bacterium, said method comprising:

transforming a host cell with at least one heterologous DNA molecule according to claim 1 under conditions suitable for expression of the DNA polymerase III-type enzyme, or subunit thereof, and

isolating the DNA polymerase III-type enzyme, or subunit thereof.

53. The method according to claim 52, wherein the enzyme subunit is selected from the group consisting of alpha, beta, tau, gamma, epsilon, delta, delta prime, and SSB subunits.

54. The method according to claim 53, wherein the enzyme subunit is a delta or delta prime subunit.

55. The method according to claim 54, wherein the thermophilic bacteria is *Thermus thermophilus*, *Aquifex aeolicus*, *Thermotoga maritima*, or *Bacillus stearothermophilus*.

56. The method according to claim 52, wherein said transforming is carried out by transforming the host cell with a plurality of heterologous DNA molecules according to claim 1 under conditions suitable for expression of the DNA polymerase III-type enzyme, or a plurality of subunits thereof, and said isolating is carried out by isolating the DNA polymerase III-type enzyme, or the plurality of subunits thereof.

57. An isolated clamp loader of a DNA polymerase III-type enzyme comprising either a heterologously expressed delta subunit, a heterologously expressed delta prime subunit, or both, derived from a thermophilic eubacteria.

58. The isolated clamp loader according to claim 57, wherein the thermophilic bacteria is a *Thermus* species, a *Thermotoga* species, an *Aquifex* species, or a *Bacillus* species.

59. The isolated clamp loader according to claim 58, wherein the thermophilic bacteria is *Thermus thermophilus*.

60. The isolated clamp loader according to claim 59, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 158.

61. The isolated clamp loader according to claim 59, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 156.

62. The isolated clamp loader according to claim 58, wherein the thermophilic bacteria is *Thermotoga maritima*.

63. The isolated clamp loader according to claim 62, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 146.

64. The isolated clamp loader according to claim 62, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 148.

65. The isolated clamp loader according to claim 58, wherein the thermophilic bacteria is *Aquifex aeolicus*.

66. The isolated clamp loader according to claim 65, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 124.

67. The isolated clamp loader according to claim 65, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 126.

68. The isolated clamp loader according to claim 58, wherein the thermophilic bacteria is *Bacillus stearothermophilus*.

69. The isolated clamp loader according to claim 68, wherein the delta subunit comprises an amino acid sequence of SEQ. ID. No. 178.

70. The isolated clamp loader according to claim 68, wherein the delta prime subunit comprises an amino acid sequence of SEQ. ID. No. 180.

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